Opportunity Title: Mosquito-borne Diseases Risk Mapping – Spatial and Temporal Modeling with Geospatial Analyses
Opportunity Reference Code: EPA-ORD-NERL-SED-2016-07

Organization	U.S. Environmental Protection Agency (EPA)
Reference Code	EPA-ORD-NERL-SED-2016-07
How to Apply	A complete application consists of:

- An application
- Transcripts – <u>Click here for detailed information about acceptable transcripts</u>
- A current resume/CV, including academic history, employment history, relevant experiences, and publication list
- Two educational or professional references

All documents must be in English or include an official English translation.

If you have questions, send an email to *EPArpp@orau.org*. Please include the reference code for this opportunity in your email.

Description	A postgraduate research training opportunity is available at the U.S. Environmental Protection Agency's (EPA) Office of Research and Development (ORD)/National Exposure Research Laboratory (NERL). The appointment will be served with the Systems Exposure Division (SED) in Research Triangle Park, NC.

The Vector Mitigation project addresses critical climate sensitive diseases issues in despaired communities. The research includes interacting with internationally recognized EnviroAtlas, which is specialized in national- and local-scale geospatial tools aimed at informing sustainability decision-making through analysis of ecosystem services. The participant will have the opportunity to:

- Become an integral part of this highly visible, highly collaborative EPA effort connected with multiple Federal and non-Federal organizations.
- Apply innovative science to develop risk management tools in order to address real-life challenges at community level, particularly in less resourced communities.
- Collaborate with EPA and external EPA modelers, GIS experts, and citizen scientists and attend training on specific technics used in the project.
- Attend national and international professional meetings to present their work and learn about other related ongoing research.
- Exercise independent initiative, innovation, and judgment in their research.
- Receive exposure to research conducted within other Federal (e.g., USDA, CDC, NIEHS, etc.) and non-Federal organizations (e.g., NC State, Duke, NCAR, University of Texas, etc.)

The participant will receive exposure by being affiliated with a highly important cross-federal agencies' efforts on mitigating mosquito-borne diseases. The research participant may conduct modeling, complex statistical, geospatial, socio-economic analyses and develop analytical
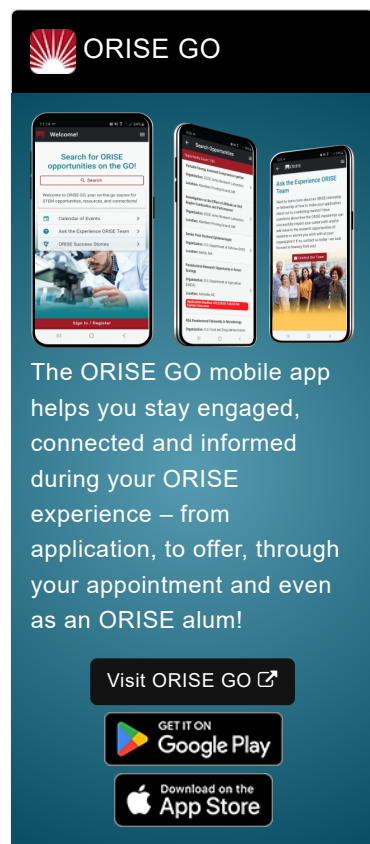
toolkits to project potential spatial and temporal mosquito (primarily Aedes) and/or mosquito-borne disease (primarily dengue, Zika and Chikungunya) risks at community level, such as Brownsville, TX, Cano Martin Peno, Puerto Rico, for the Vector Mitigation project.

The research participant will seek to establish relationships between environmental and socio-economic determinants, mosquito abundance/mosquito-borne disease incidence, risk, public health and well-being. Specifically, this training opportunity will involve the participant in the following activities:

- Research design of Vector Mitigation project for marginal communities in the United States (e.g., Brownsville, TX, Puerto Rico, etc.).
- Analysis of datasets to assess correlations between mosquito abundance/mosquito-borne diseases and environmental determinants (e.g., built and natural environments, climate), socio-economics determinants, land cover classifications, etc. in order to better understand land cover features, demographics and climate trend impacting mosquito abundance and mosquito-borne diseases.
- Identification of data layers capturing distributions and/or abundance of mosquitos/mosquito-borne diseases cases, environmental and socio-economic determinants.
- Development and adoption of innovative approaches to advance spatial and temporal mosquito abundance/mosquito-borne diseases mapping using GIS data layers and other determinants.
- Incorporating new data and tools in EnviroAtlas (https://www.epa.gov/enviroatlas) and publishing results in peer-reviewed scientific literature.

The participant will receive training in tasks related to application of highly complex geospatial data and tools and multi-disciplinary systems approaches to address environment and public health challenges such as climate sensitive diseases, vector-borne diseases.

This training opportunity will provide the research participant with exposure to cutting edge systems approach to address real world environment and human health problems, roles of socio-economics in well-beings, cutting-edge geospatial analysis, climate impacts of human health, and tool-building techniques and applied research that will inform better decision-making in regards to control mosquitos and mitigate mosquito-borne diseases risk.

As part of Mitigate Vector community project, the research participant will be involved in team activities to utilize crowdsourcing data, GIS and remote sensing data, environmental and socio-economic determinants for Aedes and Aedes-borne diseases risk identification, to develop a Use Case for EPA's EnviroAtlas ecosystem service project through developing or adopting a spatial and/or temporal models for Aedes mosquito population and/or , to develop relationship between land cover data, demographic data, climate data and mosquito abundance/mosquito-borne diseases, and to validate models output with in-situ Aedes mosquito traps data. The

research would result in risk models, maps, graphs, analysis tools, and interpretive information for authorities and public to take actions for mosquito control.

This program, administered by ORAU through its contract with the U.S. Department of Energy to manage the Oak Ridge Institute for Science and Education, was established through an interagency agreement between DOE and EPA.

Qualifications	Applicants must have received a bachelor of sciene degree and a master's or doctoral degree in environmental science studies, scientific computing and informatics, geographic information systems, forest resources and science, ecology, ecosysem ecology, entomology, infectious diseases and zoonoses, population and community ecology, or mathematics and statistics or a closely related field within five years of the desired starting date, or completion of all requirements for the degree should be expected prior to the starting date.

The appointment is full time for one year and may be renewed upon recommendation of EPA and contingent on the availability of funds. The participant will receive a monthly stipend. Funding may be made available to reimburse the participant's travel expenses to present the results of his/her research at scientific conferences. No funding will be made available to cover travel costs for pre-appointment visits, relocation costs, tuition and fees, or participant's health insurance. The participant must show proof of health and medical insurance. **The participant does not become an EPA employee**.

The mentor for this project is Dr. Pai-Yei Whung (whung.pai-yei@epa.gov). The desired date is January 16, 2017.

Eligibility Requirements	• **Degree:** Bachelor's Degree, Master's Degree, or Doctoral Degree received within the last 60 month(s). • **Discipline(s):** ○ **Communications and Graphics Design** (1 👁) ○ **Computer, Information, and Data Sciences** (1 👁) ○ **Earth and Geosciences** (1 👁) ○ **Environmental and Marine Sciences** (3 👁) ○ **Life Health and Medical Sciences** (5 👁) ○ **Mathematics and Statistics** (10 👁)